Addressing Marine Debris From Land-Based Sources in California

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Presented to CIWMB Interested Parties
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Overview of Comments

- Marine debris: components, sources, and impacts
- California Coastal Commission marine debris efforts to date
- What's happening in California to address the problems
- California Action Plan

Marine Debris Overview

- What is it?
- Sources of Marine Debris
- Composition
- Why Focus on Plastics?
- Impacts on Marine Wildlife
- Other Impacts

Marine Debris – What is it?

- Marine Debris – “Any manufactured or processed solid waste material that enters the marine environment from any source.”
- Debris is everywhere – found around every major body of water on the planet, and below water as well.
- Marine Debris is a global pollution problem that impacts human health and safety, endangers wildlife and aquatic habitats, and costs local & national economies millions in wasted resources and lost revenues.

Marine Debris Sources

- Storm water discharges
- Combined sewer overflows
- Beach visitors
- Ships and other vessels
- Solid waste disposal and landfills materials such as garbage and medical waste
- Offshore oil platforms
- Industrial activities
- Illegal dumping or littering

US EPA, August 2002. *Assessing and Monitoring Floatable Debris,* Washington, D.C. p. 2-2.

Main Sources of Marine Debris

Approximately 20% comes from ocean-based sources:

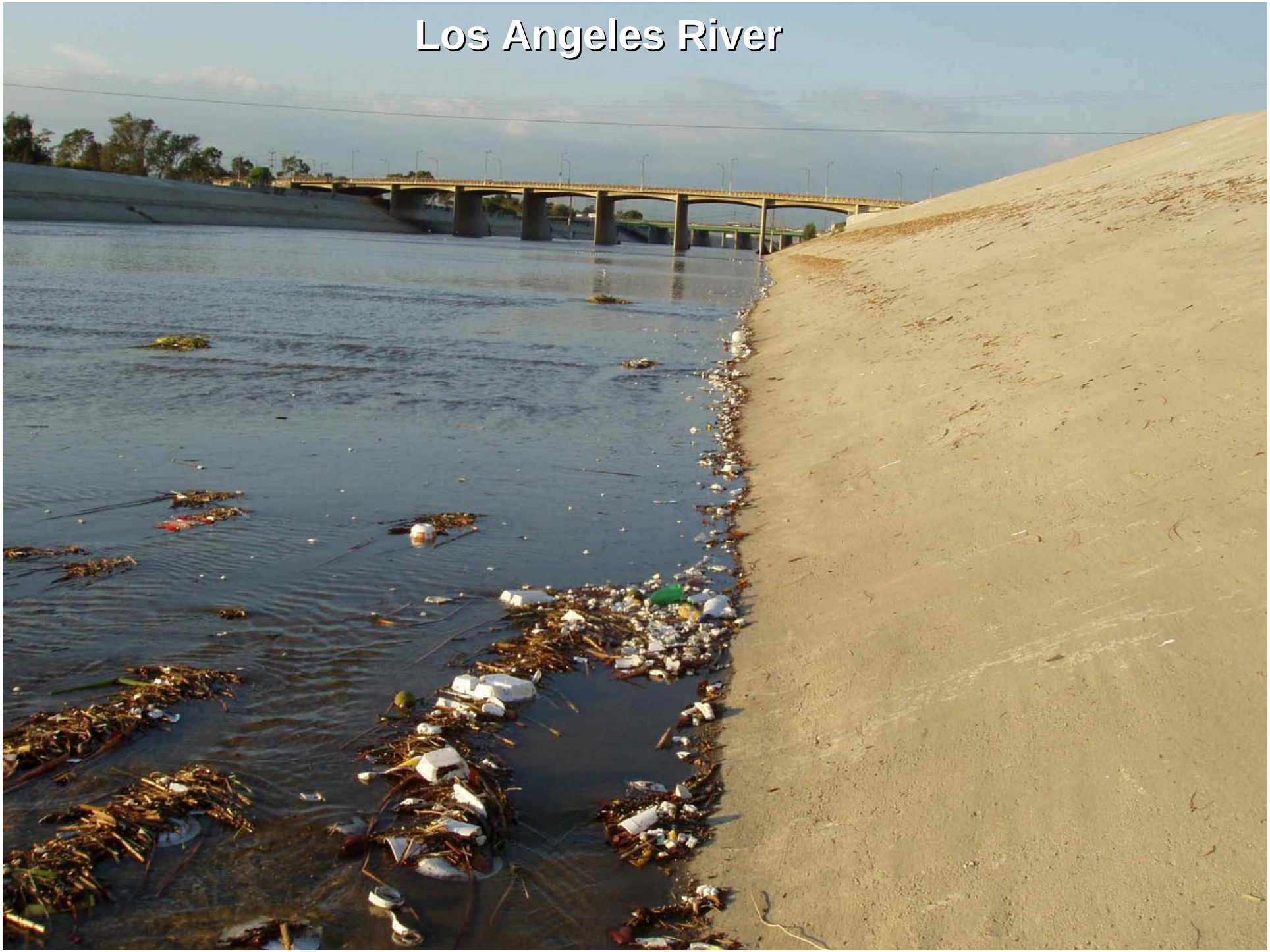
- Commercial fishing vessels
- Cargo ships (discharge of containers and garbage)
- Please cruise ships

Main Sources of Marine Debris

Approximately 80% comes from land-based sources:

- Litter (pedestrians, motorists, beach visitors)
- Industrial discharges (pellets and powders)
- Garbage management (containers, trucks, landfills)

Los Angeles River



Los Angeles River


Ballona Creek

Industrial Discharges

Marine Debris Composition

60 percent of shoreline debris is composed of plastic.

Item		Amount		Percent
1. Cigarettes/Cigarette Filters		309,891		38.4%
2. Food Wrappers and Containers		113,883		14.1%
3. Caps/Lids		60,016		7.4%
4. Cups/Plates/Forks/ Knives/Spoons		39,137		4.9%
5. Beverage Bottles (Glass)		33,289		4.1%
6. Bags		30,841		3.8%
7. Straws/Stirrers		30,594		3.8%
8. Building Materials	27,023		3.4%	
9. Beverage Bottles (Plastic) ≦2 liters		25,353		3.2%
10. Beverage Cans		23,014		2.9%
Totals:		**693,041**		**86.0%**

*** Statistics from 2004 California Coastal Cleanup Day**

Marine Debris Composition

- Ocean Debris:
  - The composition of marine debris is 60-80% plastic
  - 90% of floating litter is plastic
  - Plastic is prevalent in at all depths, from the surface of the ocean through the water column and in sediments (Southern CA Coastal Water Research Project)

Why Focus on Plastics?

- **Abundance of plastic in California and North Pacific**
  - In a 2001 Gyre study, Algalita found plastic particles less than 5mm outweighed zooplankton 6 to 1.
  - In Gyre study (2001)* there was 30% as much plastic as plankton in small sizes.
  - The same was true for Ballona Creek / LA Watershed (looking at all depths).*
  - In near coastal waters of Long Beach (2002)*, the abundance of plastic was 3x higher than the Gyre*
  - Near coastal samples showed larger pieces and fragments; ocean samples plastic pieces smaller due to photo-degradation and time.

*studies performed by the Algalita Marine Research Foundation and the Southern California Coastal Water Research Project- reported in the Marine Pollution Bulletin, For information visit www.Algalita.org

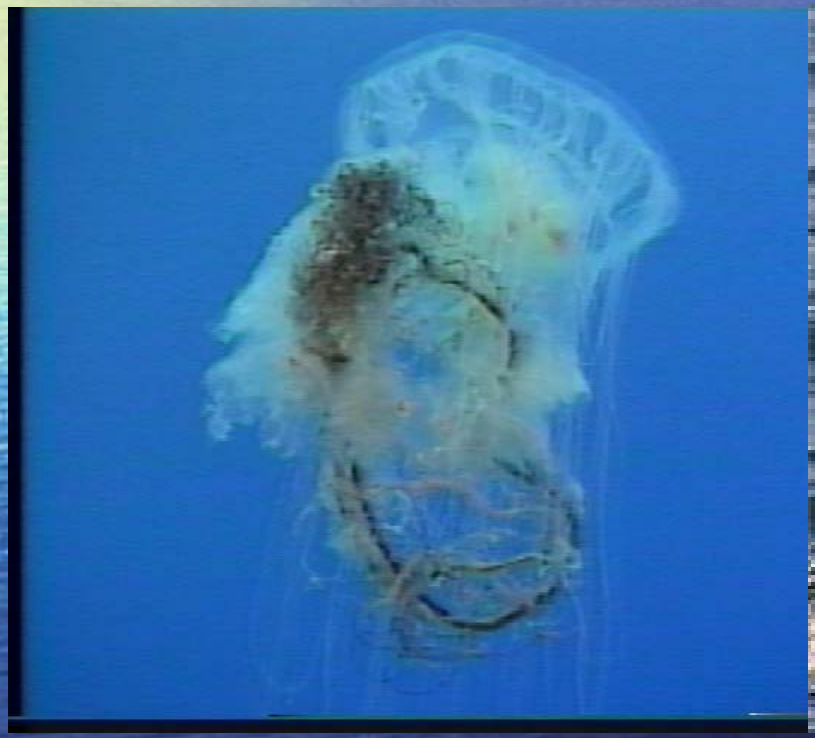
Abundance of Plastic Increasing

- **In shipping lanes between Iceland and Scotland, 3 times more plastic in the water column in the 1990s compared with the 1960s** (R. Thompson, Lost at Sea: Where is All the Plastic?" Science, Vol. 304, Issue 5672 838, 7 May 2004)
- **In Southern Atlantic Ocean, quantity of debris increased 100 times in the early 1990s** (S. Copello, Marine Pollution Bulletin, 46 (2003) 1513-1515.)
- **In coastal areas of Japan, from the 1970s to the 1980s, marine plastic particle densities increased ten fold in 10 years** (H. Ogi, Bulletin of the Faculty of Fisheries, Hokkaido University 5 (12)m 2000, 71-93)
- **In the 1990s in Japan, densities appear to have increased tenfold every 2-3 years** (H. Ogi)

Impacts on Marine Life

- **267 species known to be effected, including 86% of all sea turtle species, 44% of all sea bird species, 43% of marine mammal species** (Laist, D.W. "Impacts of marine debris" in Coe, JM, *Marine Debris: Sources, Impacts, Solutions,* Springer-Verlag, NY (1997), pp. 99-139.
- **Ingestion, entanglement, starvation, suffocation**
- **20 years ago, researchers estimated 100,000 marine mammal deaths per year in N. Pacific related to entanglement in fishing gear** (Wallace, . 1985. Debris Entanglement in the marine environment: A review. Pp. 259-277, in Proceedings on the Fate and Impact of marine Debris, NOAA)
- **Between 700,000 and 1 million seabirds are killed from entanglement or ingestion each year**

Plastic Debris Impacts All Levels of the Marine Ecosystem



100% of Laysan Albatross Impacted (NOAA)

Photo: ©Dino Ferri. Web site: http://www.audubоninstitute.org/zoo/index.htm

Other Impacts Not Well Understood

- Economic loss/tourism/beach closures not quantified
- Decline of fisheries?
- Impacts of plastic additives on marine ecosystems?
- Do plastic additives bioaccumulate causing concern about human health threats?

California Coastal Commission: Efforts to Date

- California Coastal Cleanup Day
- Plastic Debris, Rivers to Sea Project

California Coastal Cleanup Day

Largest volunteer event in the state

- 2005 Results:
  - 48,250 volunteers.
  - 970,748 pounds of debris – largest trash haul in history!
  - 2,028 linear miles of shoreline cleaned.
- Since 1985:
  - Just under 700,000 volunteers.
  - 11,023,594 pounds of debris removed.

Plastic Debris, Rivers to Sea Project

Research (Algalita Marine Research Foundation):

- Extent to which urban runoff in Los Angeles and San Gabriel River watersheds are impacted by small plastic debris (mostly industrial discharges)
- Determine effectiveness of voluntary “best management practices” implemented by plastics processing facilities

Awareness / Dialogue / Planning (CCC):

- Multi-stakeholder advisory board
- Educate stakeholders- NETWORK / LISTSERVE
- Plastic Debris, Rivers to Sea Conference Sept. 7-9, 2005
- Develop action plan for state
- www.plasticdebris.org

Funding: California Waterboards, Proposition 13 grant

The Response in California

- Regulating Trash in Urban Runoff
- Voluntary Efforts by Industry
- Bag Reduction/Recycling Efforts
- Other Local Initiatives
- Statewide Action Plan

Regulating Trash in Urban Runoff

Recent regulation by L.A. Water Board:

- In L.A. River and Ballona Creek, municipalities charged with controlling trash in urban runoff under trash Total Maximum Daily Load
- 10% reduction required annually over 10 years, to ultimately achieve zero discharge

Examples of Costs:

- L.A. County spends $1 million annually to clean beaches after storm events
- L.A. County estimated $648 million to reach zero trash in L.A. River and Ballona Creek

Voluntary Efforts by Plastics Industry

- Progressive Bag Alliance

Bag Reduction/Recycling Efforts

- City of San Francisco - Bag Use Reduction:
  - Started as proposed bag fee of $0.17 per bag (plastic or paper) at grocery stores
  - Resulted in deal with major supermarket chains to reduce bag use by 10 million by the end of next year
  - Grocers also committed to spend $100,000 towards an awareness campaign
- City of San Juan Capistrano - Bag-2-Bag Recycling

  - When City of San Juan Capistrano banned polystyrene, industry got proactive
  - Hilex Poly and CR&R joined city in collaborative effort to collect bags curbside and recycle them into new bags
  - All 8,500 homes received blue bucket and year's supply of blue bags for collection

Examples of Other Local Initiatives

- Cities of San Clemente and Dana Point joined Bag-2-Bag Program in June 2005.
- City of San Jose developing curbside plastic bag collection program
- Smoke free beach initiatives being implemented in cities up and down coast
- Polystyrene bans (Huntington Beach, Malibu, Santa Cruz, San Clemente, San Juan Capistrano)
- Many municipalities installing structural storm water controls (screens, nets, catch basin inserts) to collect trash from urban runoff, and institutional controls
- “Don’t Trash California” and “Erase the Waste” education campaigns

Statewide Effort in Process

- California Coastal Commission leading the effort in developing: *An Action Plan to Reduce Land-Based Discharges of Marine Debris in California*
- Working with wide array of "potential implementers" representing industry, government, and environmental community
- Released April 19/20 at Ocean Protection Council meeting, and distributed via email
- Available on **www.plasticdebris.org**

Highlights of the *66 Actions* in the Plan

Immediate Priorities

- **Permanent Marine Debris and Litter Programs in the State**

(1) State Mandate to Reduce Marine Debris and Litter Vested in One or More Agencies

(2) Funding and staff

- **Research**

(1) Identify trash hot spots and composition of marine litter

(2) Understand why people litter and what messages motivate behavior change in trash hot spots

(3) Understand impacts of micro-particles, potential bioaccumulation

Actions to address specific categories of marine debris

- **Littering by the general public** (pedestrians and motorists)
- **Littering by beach visitors**
- **Littering by recreational boaters and commercial fishermen**
- **Commercial shipping** (pleasure cruise ships and cargo ships in port)
- **Garbage management** (the transport and disposal of garbage)
- **Plastics manufacturing and transportation facilities**

Actions to Reduce Product Waste

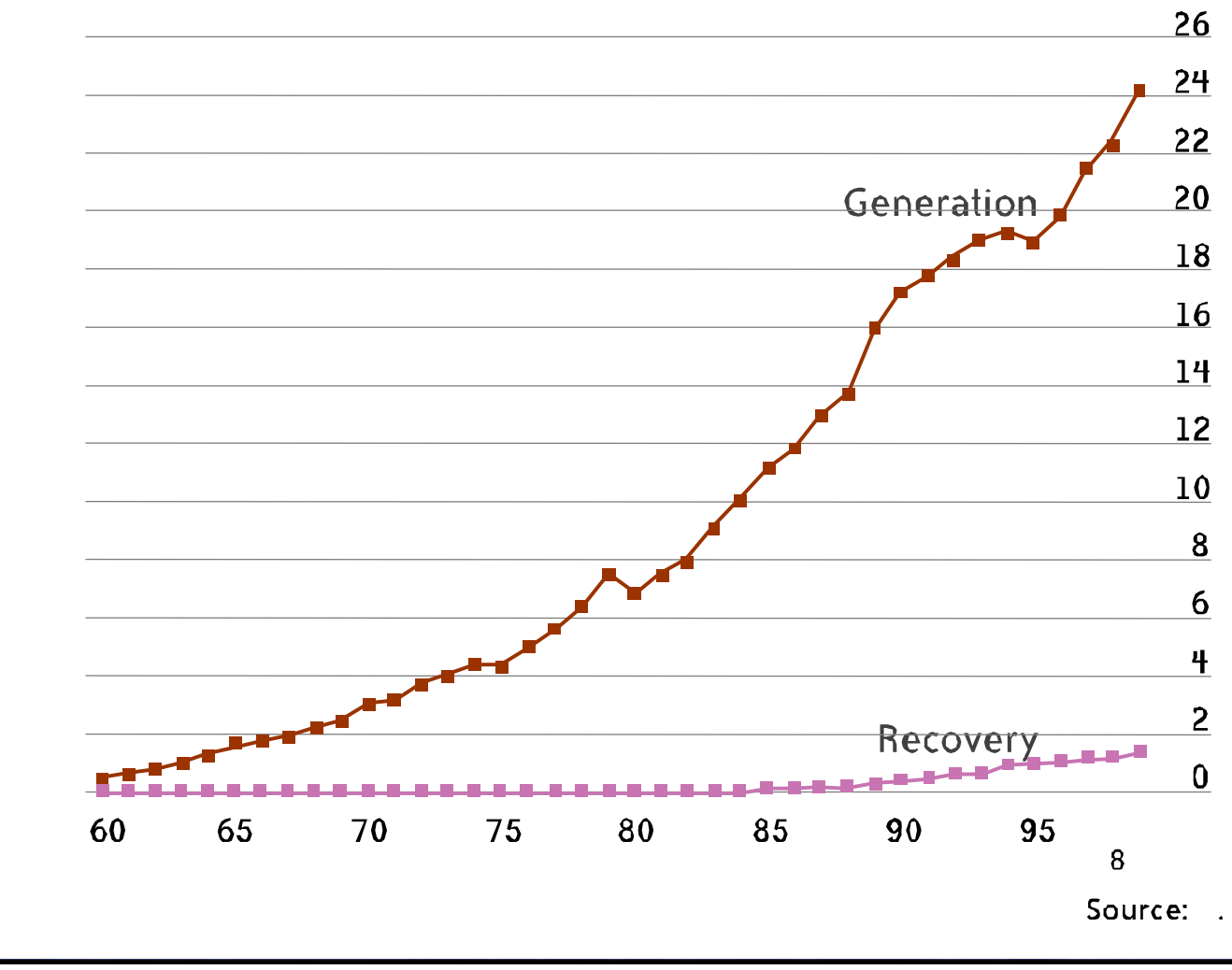
- **Reducing Waste Generated**
- **Changes in Product Packaging and Design**

Trash Generation Increasing

- Average amount of trash disposed of in U.S.households per day:
  - 2.7 lbs. in 1960
  - 4.1 lbs. in 2001
  - 94% of materials used in manufacture of average U.S. product are thrown away before the product reaches the shelves
  - For every 100 pounds of product manufactured in the U.S., 3200 pounds of waste generated
- Diversion Is Not a Cure
  - 48% diversion (recycling) rate in CA, compared to 30% nationwide
  - The amount of solid waste generated increases each year, so there's an increasing amount of material that can become litter
  - U.S. system of integrated waste management (the 3 R's) doesn't reduce the amount of waste generated

Recovery of Plastics in CA

Plastic waste generation versus recovery (recycling)- CIWMB




THANK YOU
THANK YOU
HAVE A NICE DAY

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